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Identification of language impairment in 4-year-old children using two parent report forms

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Abstract

This study evaluated the screening accuracy of two parent report forms adapted from two studies on English-speaking children (Dale, Price, Bishop & Plomin, 2003; Luinge, Post, Wit & Goorhuis-Brouwer, 2006). These adapted forms were developed to identify 4-year-old Cantonese-speaking children with language impairment. In phase I, 219 forms were distributed to parents of children in K2 classes and 77 forms were completed and returned. In phase II, 23 children (12 screened positive and 11 screened negative) received a clinical language assessment. Discriminant analyses reported low screening accuracy in both report form 1 (sensitivity = 43%, specificity = 63%) and report form 2 (sensitivity = 43%, specificity =75%). The two forms developed in this study failed to serve as an accurate screening tool to identify children with language impairment. Findings were discussed in relation to the content and design of the parent report forms, and reliability of parent report of language abilities in 4-year-old children. Research on the accuracy of the current developmental surveillance scheme and the development of accurate and sensitive screening tools were recommended.

Introduction

Language disorder is defined as an impairment in the ‘comprehension and/or use of a spoken, written, and/or other symbol system’ (American Speech, Language, and Hearing Association, 1993, Pp. 40). According to Nelson, Nygren, Walker & Panoscha (2006), about 2-19% of preschool children suffer from some forms of language disorders. Children with language disorders during their preschool years were found to be associated with persistent communication problems (Johnson et al, 1999) and reading difficulties (Catts, Fey & Tomblin, 2002) in the school years. This calls for the need for early identification of children with language impairment such that early intervention could be given to minimize negative impact to the children.

Since the introduction of the Developmental Surveillance Scheme (DSS) in 2004, Hong Kong preschool children are screened for developmental disabilities during their regular checkup visits at the Maternal Child Health Centres (MCHCs) at 2, 4, 6, 12, and 18 months and at 4 years. During these visits, nurses will interview parents on their children’s development including motor abilities, language and communication, social and play skills, self-care, vision and hearing. Based on parents’ report and their clinical observation during the interview, nurses will identify those children suspected to have a developmental delay in any aspects based on parents’ reporting and their own observation and will refer them to the appropriate specialists for full diagnostic assessment and follow-up. To enable parents to be

competent and effective observers in their children's development, the DSS also holds regular parenting workshop to allow parents have better understanding of children's developmental needs and milestones. Compared with the previous screening program at MCHCs, DSS might be more accurate in the identification of children at risk for any developmental delays through discussion with health professionals and attending regular parenting workshops. However, there has been no published report on the accuracy of the surveillance program or any of the screening tools used in the screening of preschool children with hearing, speech, language or communication impairments in Hong Kong. In the United Kingdom, 9.8% of the children referred for speech and language assessment were found to be performing within normal limits (Broomfield and Dodd, 2004). False positive screening results caused unnecessary anxiety to the parents and the children. Therefore, it is important that an accurate tool with low false positive and low false negative rates be used for hearing, speech, language and communication screening.

One format that has been documented to be valid for the screening of preschool children with language impairment is parent reports (Rescorla, 1989; Fenson et al., 1993). Compared to clinician-administered direct screening with the children, screening by parent reports has several advantages. First, parents can provide a full range of language used by the children in different naturalistic contexts and with different people (Dale, 1996). Second, it allows time for parents to observe and elicit language behaviors of their children. Third, it

increases parents' motivations in the management of their children's language problems if needed as they are involved in data collection for diagnosis (Dale, 1996).

Studies in western countries (Klee et al., 1998; Rescorla & Alley, 2001) have reported high concurrent validity, sensitivity and specificity of parents reports used as screening for language impairment in preschool children. Klee et al. (1998) reported high correlation between the Language Development Survey (LDS; Rescorla, 1989) and the clinical language sample measures ($r = .67$ -.77, $p < .001$) in a sample of 64 2-year-old children. He reported a sensitivity of 91% and specificity of 87% of the LDS, indicating that screening by LDS distributed to parents through mail yielded good screening accuracy in identifying 2-year-old children with language delay. Rescorla & Alley (2001) also reported high concurrent validity between reported vocabulary in LDS and tested vocabulary ($r = .69$ and .74, $p < 0.001$) in a larger sample of 2-year-old children ($N = 422$).

Yet Dale (1996) also pointed out that cultural differences might play a role in determining the accuracy of parent report. Differences in parental views on children's development and disabilities, as well as linguistic and pragmatic differences in different languages, might have an effect on parents' participation and reporting in the screening process. Besides, the living style of families in Hong Kong and the linguistic differences between spoken Cantonese and written Chinese might further affect the reporting accuracy of parents. For example, in many families in Hong Kong have both parents are working and

might not be the main caregivers of their children. These parents might not be the most reliable informant on their children's development. Moreover, terminology and grammatical rules in written Chinese often differ from those used in colloquial form of Cantonese. For example, '做咩' in Cantonese could represent the meaning of 'what is going on' and 'why' while '做什麼' in written Chinese could only stand for the former meaning. Such differences might create misinterpretation of items in the report forms. Furthermore, the literacy level of parents in Hong Kong might also have an impact on the screening accuracy of parent report. Thus, the validity and reliability of a screening tool administered via parent report may be different for Cantonese-speaking children in Hong Kong.

There is one published tool for screening language impairment in three-year-old children in Hong Kong. The Developmental Language Screening Scale (DLSS) (Lee, Luk, Yu & Bacon-Shone, 1985) is a parent report instrument designed for local use. The items in the instrument were divided into six subscales including verbal comprehension, verbal expression, non-verbal comprehension, non-verbal expression, interest in communication and abnormalities of speech. The first two subscales, verbal comprehension and verbal expression, were normed in Lee et al. (1990). A sample of 855 normally-developing children between 36 to 48 months old participated in the norming process. Scores in these two subscales from 234 participants were compared with the receptive and expressive language quotients of Hong Kong version of the revised Reynell Developmental Language Scales – Cantonese (RDLS-C)

(Reynell and Huntley, 1987). A moderate concurrent validity was reported (r = .45 and .40, p < 0.001) for receptive and expressive language respectively. Besides, Fong (2007) investigated the possibility of using DLSS as a screening instrument for 3-year-old children. A total of 86 children between 36 and 47 months participated in the study. Among all the participants, 20 children (12 screened-positives and 8 screened-negatives) were selected to have a clinical assessment using the RDLS-Receptive Scale and delayed sentence imitation (Mok, 1995) to evaluate their verbal comprehension and expression. Unlike Lee et al. (1990) where age-equivalent scores were used as cut-offs for clinical diagnosis, Fong compared clinical scores with the child's age peers for clinical diagnosis. Weak correlation (r = .27-.34, p < .05) was found between the scores in DLSS and RDLS-C in 20 participants participating in the clinical assessment. Screening accuracy was evaluated by sensitivity, specificity, positive likelihood ratio and negative likelihood ratio. Results showed that DLSS had poor screening accuracy (with sensitivity of 75% and specificity of 50%). She recommended further research to develop a valid screening tool for identifying preschool children with language impairment.

Diamond & Squires (1993) suggested that parents of preschool children can more accurately report their children's language ability than those of young infants or school-aged children. Many studies reported on the validity of parent reports for 2 and 3 year-old children (Klee et al., 1998; Rescorla & Alley, 2001; Thal, O'Hanlon, Clemmons & Fralin, 1999). As

children grow older, language productions are more complex and developmental milestones for language might not be as observable as when they were toddlers. Yet, there have been no known screening instruments which evaluate older preschool children's language abilities using parent reports. This raised a question of whether parents of older preschool children are able to provide accurate information on language productions of their children for screening purposes.

There were two reports on parent report forms for use with 4-year-old children (Dale, Price, Bishop & Plomin, 2003; Luinge, Post, Wit & Goorhuis-Brouwer, 2006), but one form was not developed for screening purposes while the other had not been validated. In Dale et al. (2003), the study investigated which 2-year-old children with an early language delay were more likely to have persistent and transient language problems. Their outcomes at 3 and 4 years were compared with the typically developing children. Parent report measures were used to define those participants with language delay at the age of 2, 3 and 4. The parent report form for use at 4 years was developed based on literature review and pilot testing. Children were defined as having persistent language problems based on separate scores in three language measures including vocabulary, grammar and abstract language.

Luinge et al., (2006) aimed at developing an instrument to be used in Netherlands within the primary health care system to replace the current instruments used which were time-consuming and created a number of over-referral. Items in the instrument were all

language milestones selected from the literature, existing screening instruments and descriptive stages. These include different language processes in both expressive and receptive language abilities. The language milestones were then scaled with a sample of 527 children from 1 to 6 years of age by telephone interviews with parents. All milestones were tested and those insensitive milestones were rejected from the final screening instruments. Unlike Dale et al. (2003), items from all domains of language were calculated in one single score which define children with screened positive or negative. Although for both of these parent report forms, validity has not been investigated, they can serve as a basis to develop a Cantonese version of a parent report form for 4-year-old children for screening purpose.

This study aimed to develop a screening tool to identify 4-year-old preschool children who may be at risk for language disorder. This study will investigate (i) the screening accuracy of the two parent report tools adapted for this study (ii) which adapted parent report measures yielded a higher screening accuracy.

Method

There were two phases in the study. In phase I, children were screened for language impairment using the two parent report forms. In phase II, a sample of children were assessed clinically using two standandized tests to evaluate the screening accuracy. of the forms.

Phase I Screening

Procedures

All second-year kindergarten children and their parents from four kindergartens were invited to participate in this study. Three kindergartens were located in public housing estates and private housing area in Tin Shui Wai, Tuen Mun and Sham Shui Po. The remaining kindergarten was located in a residential area in Kowloon City. These kindergartens came from two different geographic areas in Hong Kong, which seemed to differ in the socio-economic status (SES) of the populations. An information sheet and two parent report forms (Appendix B and C) were distributed to the parents through the kindergartens. Background information including previous speech and language assessment and intervention, parental concerns, parental education level and occupation and primary language spoken at home, was collected using an attached case history form (Appendix A).

The parent report forms were returned one week after distribution. The completed forms were scored by a colleague of the principal researcher to ensure blinding of the screening results before diagnostic testing to avoid any bias.

Participants

There were 219 children in the K2 classrooms in the four participating kindergartens. Children whose age fell outside the range of 48- to 59-months were excluded. Children who had previously received speech and language assessment or intervention were excluded as those parents might artificially increase the screening accuracy. Since the standardized tests in Phase II were designed for use with monolingual children, children who were bilingual

(children who were exposed to non-Cantonese in less than six out of ten in proportion of time reported in case history form) were also excluded.

Parent Report Forms

Form 1

Items in this form were adapted from the 4-year-old measures developed in Dale et al. (2003), which include 3 language measures: vocabulary, grammar rating and abstract language. As the vocabulary list used in Dale et al. (2003) was not included in the published article, and it intended for English-speaking children, the 48 items included in the vocabulary measure for use in this study were selected from the 4-year-old list in the data based reported in Opper (1996) and Tse (2006). This data base reported on the different words observed in preschool children. These 48 items included words from the noun, verb adverb and adjective categories. The measure of abstract language in Dale et al. (1993) was used in this study with the replacement of 1 out of the 14 items in the original with the use of modal auxillaries in 4-year-old children, as reported in Fletcher, Leung, Stokes & Weizman. (2000). The grammar rating measure in Dale et al. (1993) was directly used with adapted examples of sentences with different length. Cut-off criteria were adapted from Dale et al. (2003). Positive screens were defined as failure in two out of the three measures (less than 29/48 in Vocabulary, 6/6 in Grammar rating and 8/14 in Abstract Language).

Form 2

Items were adapted from the parent report form developed in Luinge et al. (2006). As in form 1, 2 of the original items were replaced with items more relevant for Cantonese-speaking 4-year-old children. These items included noun classifiers (Tse, Hui & Leung, 2007) and verbs in serial expression (Tse, Kwong, Chan & Hui, 2002). As the best cut-off point had not been investigated, it was set by the principal researcher. Children who received a score less than 10 out of 14 items (about 70%) were regarded as screen positives.

Phase II Clinical Diagnosis

Participants

Children who were screened positive in one, or both, parent report forms were invited to participate in phase II for a clinical assessment. A similar number of children was randomly selected by a colleague of the principal researcher from the remaining cases, i.e. those were screened negatives in both forms, and invited to participate in phase II.

Procedures

The assessment was conducted by the principal researcher. The supervisor of this study, who is a practicing speech therapist, observed and gave feedback to the principal researcher on her administration of the diagnostic tests in a pilot session. The principal researcher consulted the speech therapist on interpretation of the screening and diagnostic results for all children in phase 2 before they were conveyed to the parents. Both the caregivers and principal researcher were blinded about the screening results to avoid subjective bias during

administration of the diagnostic tests and interpretation of test results (Dollaghan, 2007).

Measures

Verbal comprehension was assessed by the Hong Kong version of the revised Reynell Developmental Language Scales – Cantonese (RDLS-C) (Reynell and Huntley, 1987) while verbal expression was assessed using Delayed Sentence Imitation task adapted from the Cantonese Adaptation of the Test for Reception of Grammar (CTROG) (Mok, 1995). Children who scored more than one standard deviation below mean in either or both of the reference tests were diagnosed to have language impairment.

Test-retest Reliability

Two parents of the participants were randomly selected and invited to complete the parent report forms two weeks after the clinical assessment of their children. Scoring of the forms completed during phase I and phase II was compared and the percentage of agreement was used to evaluate the test-retest reliability. Percentage agreement of the scores between the parent forms filled by the two parents in phase I and phase II yielded a reliability coefficient of 0.96. The parents were considered consistent in their responses on the parent report forms.

Results

Phase I

Among the 219 parent report forms distributed, 112 were completed and returned and this gave a response rate of 51.5%. Thirty four children were excluded among which 24 were

out of the target age range, 9 received prior speech and language assessment or intervention and 1 did not speak Cantonese as his first language. Eventually, 77 children were included in Phase 1. Among those included, 12 were screened positive using the criteria listed previously (failed either, or both ,report forms). Four screened positive cases failed both forms, five failed only report form 1 and three failed only report form 2.

Phase II

All screened positive cases (n = 12) were invited to receive a clinical assessment in phase II. Among the 65 screened negative cases, 11 participants were randomly selected to participate in phase II. There were in total 23 children from 4;01 to 4;10 (mean age = 4;06, M = 4.52). Twelve children were boys (52.2%) while eleven children were girls (47.8%). According to the data reported in the background information form given in phase I, ten parents (43.4%) expressed concern with these children's speech (n=3) and language abilities (n=7). Five parents (22%) were not the primary caregiver of their children, who were looked after by their grandparents or their domestic helpers.

Clinical Outcome

Using a cut-off criterion of one standard deviation below mean on either or both tests used in the clinical assessment, seven of the 23 children (four girls and there boys) were diagnosed to have a language impairment. Two out of these 7 children failed both the receptive and expressive language tests while the remaining five children only failed the

expressive language test. The percentage of children diagnosed with language impairment in phase II was 30.4% (7/23), while the prevalence of children with language impairment in the sample of 77 children included in this study was 9.1% (7/77).

Discriminant Analysis

Discriminant analyses were undertaken to examine the screening accuracy of the two parent report forms respectively. The following table illustrates the relationship between the results of parent report forms and clinical assessment:

	Diagnostic positive	Diagnostic negative
Screened Positive	True positive (a)	False positive (b)
Screened Negative	False negative (c)	True negative (d)

A screening tool is considered accurate when there is a high correspondence between the screening and the follow-up clinical assessment results. Sensitivity and specificity are two measures that are often calculated to evaluate the accuracy of screening tools. Sensitivity is calculated by the number of true positive cases over the total number of children diagnosed with language impairment (a/a+c). It is a measure of the proportion of children with language impairment to be identified as positive by the screening instrument. Specificity is calculated by the number of true negative cases over the total number of children diagnosed with normally-developing language abilities. It is a measure of the proportion of children with normal language development to be identified as negative by the screening instrument. Since

these two measures are susceptible to sample characteristics, positive likelihood ratio (LR+) and negative likelihood ratio (LR-) were also calculated (Dollaghan, 2007). LR+ (sensitivity/1-specificity) indicates how confident one can say that children with positive screens would actually be diagnosed to have language impairment while LR- (1-sensitivity/specficity) indicates how confident one can say that children with negative screens would be diagnosed as having normal language development. As suggested by Dollaghan (2007), an accurate diagnostic measure should have a LR+ higher than 10 while LR- should be lower than 0.10.

Report form 1

The following table illustrates the number of cases identified as positive and negative cases by parent report form 1 and the clinical assessment:

	Diagnostic Positive	Diagnostic Negative
Screened Positive	3	6
Screened Negative	4	10

Sensitivity of this report form 1 was 43% (3/7) while specificity of this report form 2 was 63% (10/16). The positive likelihood ratio (LR+) was found to be 1.16 while the negative likelihood ratio (LR-) was 0.9. According to Dollaghan (2007), both LR+ and LR- could be described as neutral where neither positive nor negative screening results were uninformative for diagnosing or ruling out the disorder.

Report form 2

The following table illustrates the number of cases identified as positive and negative cases by parent report form 2:

	Diagnostic Positive	Diagnostic Negative
Screened Positive	3	4
Screened Negative	4	12

Sensitivity of this report form 2 was 43% (3/7) while specificity was 75% (12/16). The positive likelihood ratio (LR+) was found to be 1.72 while the negative likelihood ratio (LR-) was 0.76. According to Dollaghan (2007), both LR+ and LR- could be described as neutral where neither positive nor negative screening results were uninformative for diagnosing or ruling out disorder.

Combined Report form 1 and form 2

Parent report form 1 and 2 were considered together to see if there are any changes in screening accuracy. Children failed one or both forms were regarded as screened positive cases while the remaining cases were regarded as screened negative cases. The following table illustrates the number of cases identified as positive and negative cases by combined report form 1 and form 2 and the clinical assessment:

	Diagnostic positive	Diagnostic negative
Screened positive	4	8

Screened negative	3	8

Sensitivity of the combined report forms was found to be 57% (4/7) while specificity was found to be 50% (8/16). The positive likelihood ratio (LR+) was found to be 1.14 while the negative likelihood ratio (LR-) was 0.86. Like the forms considered separately, both LR+ and LR- could be described as neutral. Neither positive nor negative screening results were informative for diagnosing or ruling out the disorder (Dollaghan, 2007).

Discussion

Screening accuracy of the two parent report forms

From the discriminant analyses, both parent report forms had low sensitivity and low specificity. Low sensitivity indicates that the screening instrument had a high tendency to miss out those children with language impairment while low specificity indicates that it had a high tendency to over-refer children with normal language development. Together with the low LR+ and high LR-, both parent report forms were uninformative for diagnosing 4-year-old children with language impairment and ruling out those with normally developing language abilities, based on the criteria suggested by Dollaghan (2007). Combining the parent report form 1 and 2 also did not give rise to higher screening accuracy.

Applicability of the two parent report forms as screening tools

Ten and 8 cases out of the 23 cases were found to be misidentified by the parent report forms 1 and 2 respectively. If either of these forms were used as a screening instrument, quite

a large number of children with language impairment would be missed out, and children with normal language skills would be over-referred. These caused problems to the children, their parents and the community. Over-referral of false positive cases would lead to unnecessary anxiety to the children and their parents and was costly to provide diagnostic assessment to these children who have normal language development. A large number of false negative cases would lead to false perception to the parents and children, and a delay in the identification of language impairment.

According to Dale (1996), parent reports can serve as a valid and reliable screening tool for identifying children with language impairment, especially during the preschool period. Language abilities in children are more observable by caregivers with no professional training on child language development while parents, who spend most time with their children, are believed to be able to obtain a full language profile of their children. The use of parent reports as a preschool language screening tools in western countries has been supported by a number of studies (Klee et al., 1998; Rescorla & Alley, 2001; Thal, O'Hanlon., Clemmons & Fralin, 1999). However, the two parent report forms in this study yielded low screening accuracy and thus failed to serve as a screening instrument to identify 4-year-old Cantonese-speaking children with language impairment. A number of factors might have contributed to this. These include the design and content of the adapted parent report forms, and the differences in the cultural background of sample children.

Design and content of the parent reports

The two parent report forms in this study were adapted from western studies (Dale et al., 2003; Luinge et al., 2006). Despite the extensiveness of the language items included, they have their own limitations. The first report form, which was adapted from Dale et al. (2003), was not originally developed for screening purpose. Therefore, the items might not be sensitive enough for the purpose of differentiating children with and without language impairment. On the other hand, the second report form was adapted from Luinge et al. (2006). In their study, language milestones were selected as items based on parental report on their children's language abilities in the Netherlands. Insensitive items were rejected from the final product of the screening instrument. This locally specific content might limit the use of the screening instrument in other countries, as in the current study. Also, the cut-off criteria in this report form were arbitrarily set by the principal researcher as mentioned in the Method which might have a consequence on the screening accuracy of this particular report form.

Besides the content of the parent repot forms, their design might also be a contributing factor to their poor accuracy. Dale (1996) suggested that parent reports were most likely to be accurate when assessed items included only current but not past behaviors, and recommended that a recognition format, instead of listing out items under a category, should be used. These would help reduce parents' memory load when filling in the parent report. In Fong's (2007) study, she argued that one of the contributing factors of the low screening accuracy of DLSS

was that some items in DLSS required the parents to recall their children's cumulative or past behaviours, which would probably result in inaccurate reporting. Although both parent report forms in this study focused on current behaviours, parents were required to report children's use of certain specific sentences, words or structures. These might be dependent on parents' linguistic knowledge. For example, parents were required to report whether their children were able to joke with rhyming words. This depended on parents' understanding and knowledge on rhyming. Parents were also asked to report whether their children were able to make sentences of 3 or 4 words (三至四詞句子). Yet the distinction between /zi6/ 字 (characters) and /tsh4/ 詞(words) in Chinese was not commonly known and required linguistic training. For example, the sentence 'I eat apple' (我食蘋果) include 3 English words but it can be interpreted as having 4 Chinese characters or 3 Chinese words. Limited understanding on the definition of 'Chinese words' (/tsh4/ 詞) might have led to inaccurate reporting of their children's sentence length. Although examples were given for most items in both parent report forms, the linguistic demand placed on parents might have led to misinterpretation, thus lower screening accuracy.

Cultural difference in parental and environmental characteristics

Dale (1996) pointed out that cultural differences might affect the applicability of using parent reports as screening instruments for language impairment. In Fong's (2007)'s study, the parent questionnaire DLSS was found to have low sensitivity and specificity and failed to

serve as an accurate screening tool to identify 3-year-old Cantonese-speaking children in Hong Kong, as in this study. Parental and environmental characteristics might have played a role in these Hong Kong studies. Reliability and validity of parents' perception of their children's language development were considered to be two of the likely contributing factors.

Test-retest reliability was found to be over 90% in this study. This suggests that parents' understanding of their child's language abilities was basically consistent. A number of factors might have influenced the perception and understanding of their children's language abilities, however. These include whether parents were main caregivers of their children and whether parents expressed concern on their children's language development. The effect of these factors on screening accuracy of the report forms were investigated by dividing the sample into two groups based on these factors with the data from combined parent report forms. The number of correctly identified cases (true positive and true negative cases) and misidentified cases (false positive and false negative cases) were compared.

First, parents were claimed to have the most extensive experience in observing their children's language abilities (Dale, 1996). Yet in Hong Kong, many parents work long hours and their children are looked after by their grandparents or domestic helpers. They are very likely not the persons who spend the most time with their children. In this study, among the 23 children in stage II, 5 (22%) did not have parents as their primary caretakers, while 2 of them were looked after by their domestic maids and 3 of them by their grandparents. These

children's parents spent only 1 to 2 hours at home with their children every day after work. Based on limited experience and time spent with their children, these parents might have underestimated their children's language abilities. Although parents' understanding of their children's language abilities was consistent, as reflected by the high test-retest reliability, their understanding or perception might not be accurate. This might explain the discrepancy between screening results based on parent report forms and the clinical assessment results. This study found that the percentage of true positive and negative cases in the group of children with parents as main caregivers was 69% (11/16) while those without parents as main caregivers was 40% (2/5). This might suggest that children who do not have parents as their main caregivers were more likely to have inaccurate screening based on parent report.

Second, Fong's (2007) study highlighted that one parent of a false positive case expressed negative perception on her child's language development who was later diagnosed to have average language abilities in the clinical assessment. She suggested that negative perceptions of caregivers might have led to underestimation of their children's language abilities in the parent report. In this study, seven parents indicated concerns about their children's language development, and all of their children were screened positive based on the two parent report forms. Of these seven children, only two (29%) were confirmed true positive cases while remaining 5 (71%) were all false positive cases. Besides, thirteen parents did not indicate any concern about their children's language development, only 46% (6/13) of

these children were true negative cases and 15% (2/13) were true positive cases. This suggested that some parents might not have accurate knowledge or appropriate interpretation of their children's language development. In addition to the fact that some parents were not their children's main caregivers, limited information available in their social context might also be another factor leading to inappropriate perception, thus more false identified cases.

Research implication

Both parent report forms used in this study failed to serve as an accurate screening instrument to identify 4-year-old Cantonese-speaking preschool children with language impairment in Hong Kong. This is consistent with Fong's study (2007) conducted in Hong Kong to identify 3-year-old preschool children with language impairment using DLSS, a parent questionnaire. Insensitive items and arbitrary cut-off, as well as parental characteristics and cultural differences, might have lowered their screening accuracy.

Early identification of language impairment is important. Early intervention can be given to children in need in order to minimize any negative impact on their social, psychological and academic development. In Hong Kong, children will receive developmental screening at the age of 2, 4, 6, 12, 18 months and 4 years at the Maternal Child Healthcare Centres (MCHCs) under the Developmental Surveillance Scheme (DSS). In this study, seven children were diagnosed to have language impairment in stage II. In addition, three out of the 23 children in stage II were found to have age-inappropriate articulation

errors and two parents expressed concern on reading abilities and attention of their children. These children with speech and language difficulties were not identified under the DSS. Also, parents' concern on the developmental problems of their children did not seem to be adequately addressed and clarified in the parental workshops or regular visits at the MCHCs. Therefore, evaluation of the effectiveness of current surveillance program and the accuracy of the speech and language screening tools used in the program become an urging need.

Future research should identify Cantonese language milestones for Cantonese preschool children. All domains of expressive and receptive language should be selected and scaled to develop a more sensitive screening instrument for local use. Cut-off scores should be investigated through valid statistical process such as ROC curve with a larger sample size.

Although studies evaluating the screening accuracy of self-reported parent questionnaires in Hong Kong yielded low validity and screening accuracy, preschool setting still offer a cost-effective way for universal screening for language impairment. Alternative administration of screening tools can be considered. For example, teachers could be informants for language screening. Preschool teachers have rich experience and plenty of opportunities with different preschool children from different backgrounds. They are more likely to have appropriate expectations of children's language development and could serve as more accurate informant for screening instruments. As in Hauerwas and Stone (2000), teachers were found to be more accurate in rating school-age children (5;00 – 7;00) with SLI

than their parents. Thus, teachers' report can be a potentially reliable and valid alternative, especially for older preschool children where identification of language milestone markers might require a higher level of linguistic knowledge. Besides, some parents might still earn the benefit of having extensive experience with their children in different contexts. Parent questionnaires obtained by well-trained personnel as interviewers could be another potential alternative. During interviews, linguistic terms used in the questionnaires could be explained and misunderstanding or inappropriate expectation of children's language development could be clarified. Lastly, the newly introduced Developmental Surveillance Scheme (DSS) at the Maternal Child Healthcare Centre (MCHCs) aimed at increasing parents' knowledge on child development. More accurate parental reports, hence higher screening accuracy, might be obtained through this scheme in later years.

Conclusion

In conclusion, self-reported parent report forms in this study were found to yield low sensitivity and specificity. Insensitive content and scoring of the two parent report forms, limited experience with children and limited linguistic knowledge of the parents in Hong Kong might have lowered screening accuracy of self-reported questionnaires to identify 4-year-old children with language impairment. Further research can work on developing a sensitive screening instrument and alternative administration screening procedures.

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Appendix A

Background Information Form

Background Information 背景資料

Child Name 學童姓名：_____ Date 填寫日期：_____

Sex 學童性別：_____ Date of Birth 出生日期：_____

Age 年齡：_____ years 歲 _____ months 個月

Respondent 填寫人姓名：_____

Relationship with Child 與學童之關係：_____ Tel 聯絡電話：_____

Please check (✓) all appropriate items 請在適當的空格內填上"✓"號

Child Background 學童背景

1. Has your child ever received a speech and language assessment?
   貴子弟曾否接受言語評估？
   No 沒有 ☐ Yes 有 ☐ (Results 結果：_____)
2. Has your child ever received speech and language therapy?
   貴子弟曾否接受言語治療？
   No 沒有 ☐ Yes 有 ☐ (Reason 原因：_____)
3. Has your child ever been diagnosed to have any other problems (e.g. ear infection)?
   貴子弟曾否被診斷患有其他病患 (例：中耳炎)？
   No 沒有 ☐ Yes 有 ☐ (Please specify 請註明：_____)
4. What are your concerns towards your child's speech and language development?
   您對貴子弟的言語發展有何顧慮？

   _____

Family Background 家庭背景

1. What language(s) do you use at home?
   在家中使用哪種語言 (可多於一種)？

   _____

   How much time will you use to speak to your child in Cantonese?
   您會花多少時間與貴子弟以廣東話溝通？

never 從不					half 一半					always 經常
0 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐

2. How many hours do you spend with your child each week?
   您每週約花多少時間與貴子弟相處？ _____ hours 小時
3. How many siblings does your child have?
   貴子弟共有多少兄弟姐妹？
   elder brother 兄 ____ elder sister 姐 ____
   younger brother 弟 ____ younger sister 妹 ____
4. Who usually take care of your child?
   貴子弟通常由誰照顧？ _____
5. Has any of your family member been diagnosed to have a speech and language problem?
   家中有沒有成員被診斷患上言語障礙？
   No 沒有 ☐ Yes 有 ☐ (Please specify 請註明：_____)

Parent Background 家長背景

1. Educational level 教育程度
   Father 父： Primary 小學 ☐ Secondary 中學 ☐
   Tertiary 大專/大學 ☐ Master or 碩 above 士或以上 ☐
   Mother 母： Primary 小學 ☐ Secondary 中學 ☐
   Tertiary 大專/大學 ☐ Master or 碩 above 士或以上 ☐
2. Occupation 職業 Father 父：_____ Mother 母：_____

Appendix B

Parent report form 1

甲：詞彙運用

若您的孩子曾使用以下詞彙，請在詞彙右方的空格加上 ***'√'號***

１・人	☐	１５・睇	☐	２９・女仔	☐	４２・嚟	☐
２・飯	☐	１６・俾	☐	３０・男仔	☐	（例：你嚟我屋企丫）	
３・水	☐	１７・煮	☐	３１・多	☐	４３・完	☐
４・可以	☐	１８・攞	☐	３２・大	☐	（例：食完飯要洗手）	
５・茶	☐	１９・飲	☐	３３・死	☐	４４・咗	☐
６・碟	☐	２０・整	☐	３４・爛	☐	（例：你食咗飯未）	
７・屋企	☐	２１・擺	☐	３５・唔	☐	４５・好	☐
８・媽咪	☐	２２・重	☐	３６・落去	☐	（例：好大、好熱）	
９・ＢＢ	☐	２３・要	☐	３７・嬲	☐	４６・係	☐
１０・有	☐	２４・星期	☐	３８・橙色	☐	（例：我係女仔）	
１１・冇	☐	２５・不如	☐	３９・藍色	☐	４７・得	☐
１２・食	☐	２６・想	☐	４０・手指公	☐	（例：食得好飽）	
１３・玩	☐	２７・去	☐	４１・眼眉	☐	４８・知	☐
１４・做	☐	２８・長方形	☐			（例：你知唔知）	

乙：文法評分

以下哪***一項***最能形容您的孩子的話語？(請***圈出***最適合者)

1. 未能說話
2. 他／她能說話，但您不明白他／他的意思
3. 話語以一個字為主，如‘奶奶’或‘落去’
4. 話語以兩至三個字為主，如‘俾媽咪’或‘我攞波波’
5. 以完整句子說話，如‘我有一個公仔’或‘我可唔可以出去’
6. 以長而複雜的句子說話，如‘我去公園嗰時會玩鞦韆’或‘我見倒個男人企喺角落頭’

丙：抽象語言運用

(請*圈出*最適合者)

1	您的孩子能否說出自己的歲數？	能 ／ 不能
2	您的孩子能否說出自己的生日月份及日期？	能 ／ 不能
3	您的孩子能否像說故事般告訴您過去事件的經過？（如生日派對或到迪士尼樂園）	能 ／ 不能
4	您的孩子能否清楚說出將會做的事情？（如明天或下星期的事）	能 ／ 不能
5	您的孩子能否自行敍述童話故事？（故事情節必須順序）	能 ／ 不能
6	您的孩子能否分辨左右手？	能 ／ 不能
7	您的孩子能否正確使用「今日」這詞語？	能 ／ 不能
8	您的孩子能否正確使用「聽日」這詞語？	能 ／ 不能
9	您的孩子能否明白「唔小心」和「突登／專登」的分別？	能 ／ 不能
１０	您的孩子會否使用含有「但／但係」的句子？	會 ／ 不會
１１	您的孩子會否使用「之前／之後」的句子來敍述事件的次序？	會 ／ 不會
１２	您的孩子會否使用含有「應該」的句子？	會 ／ 不會
１３	您的孩子曾否問您字詞的意思？（如‘「士巴拿」係咩黎架？’）	曾 ／ 不曾
１４	你的小朋友會否利用押韻的字音說笑?（如‘包剪揼,小飛俠, 輸左ｏ個個俾人罰’）	會 ／ 不會

Appendix C

Parent report form 2

請*圈起*最適合者

1	您的孩子能理解三詞句子嗎？ （如「喺枱上面」）	能 ／ 不能
2	您的孩子能否說出四詞句子？ （如「我想食餅乾」）	能 ／ 不能
3	您的孩子能否說出某些物件的顏色？	會 ／ 不會
4	您的孩子會否問問題？ （如「呢個咩嚟」）	能 ／ 不能
5	您的孩子說的話次序是否正確？ （次序不正確的句子如「爸爸返工喺公司」）	會 ／ 不會
6	您的孩子會否使用形容詞？ （如大、細、肥等）	能 ／ 不能
7	您的孩子能否用圖畫/故事書重述一個故事？	能 ／ 不能
8	您的孩子能否自行說出事件的經過？ （如學校發生的事情）	能 ／ 不能
9	您的孩子能否使用長句子？ （如「我朝早返學嗰時，有隻貓喺學校門口」）	能 ／ 不能
10	您能否明白您的孩子四分三的說話內容？	能 ／ 不能
11	您的孩子會否在同一單句裏使用兩個動詞， 如以下句式： －我幫你打電話 －我同你睇醫生 －我用厠紙整朵花 －你搵啲嘢載住佢 －你將本書擺喺書包	會 ／ 不會
12	您的孩子會否使用「本」、「塊」或「張」這些量詞？ （如「一本書」,「三塊餅」或「一張紙」）	能 ／ 不能

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